

California Division of Mines and Geology

Fault Evaluation Report FER-91

May 18, 1979

1. Name of fault group

The Laguna Salada fault and a multitude of short, unnamed faults in the Yuha Desert area.

2. Location of faults

These faults occur within the Painted Gorge, Coyote Wells, and Yuha Basin quadrangles, southwestern Imperial County (figure 1).

3. Reason for evaluation

These faults lie within the 1978 study area of the 10-year program for fault evaluation.

4. List of references

Clark, M.M., 1978, Map of the Elsinore and Earthquake Valley faults, San Diego and Imperial Counties, California. Unpublished work in progress.

Jennings, C.W., 1975, Fault map of California with locations of volcanoes, thermal springs, and thermal wells: California Division of Mines and Geology, California Geologic Map Series, Map No. 1, Scale 1:750,000.

Kovach, R.L., Allen, C.R., and Press, F., 1962, Geophysical investigations in the Colorado Delta region: Journal of Geophysical Research, v. 67, n. 7, p. 2845-2871.

Real, C.R., Parke, D.L., and Topozada, T.R., 1978, Magnetic tape catalog of California earthquakes, 1900-1974: California Division of Mines and Geology.

Designation: Fairchild C-15152

Date: April 21, 1950

Scale: 1:26,000

Type: black and white, vertical stereo

Coverage: Elsinore fault, southeastward from Mason Valley to the Mexican border.

Availability: Fairchild aerial photo collection, Geology Department, Whittier College, Whittier, California.

## 5. Summary of available data

Kovach and others (1962) delineated the Laguna Salada fault on their figures 1 and 4. Both are small-scale maps, with the fault shown in a very generalized manner. They delineated this and other faults during their geophysical study of the subsurface characteristics of the Colorado River delta region. They state (p. 2852) that "fresh scarps" occur along this fault at the east side of Laguna Salada in Mexico. They do not say anything about the character of that part of the fault that extends northward into the United States. They do suggest that the Laguna Salada fault represents the southeastward continuation of the Elsinore fault system.

Clark (1978) mapped the geomorphic features indicative of recent faulting throughout the area under consideration in this report. His mapping shows the Laguna Salada fault and numerous other shorter faults to the west and north. His mapping, with his annotations, is compiled onto figure 2 of this report. The features he mapped were mainly scarps, but closed depressions and vegetation lineaments are also shown. Clark makes no specific interpretations as to which faults have been active during Holocene time, but his annotations are in places suggestive. The epicenter map (figure 3) shows very low seismicity in the area covered by this report, and no epicenters that can be related to any of the faults under consideration.

## 6. and 7. Interpretation of aerial photography and field observations

I examined all of this area on aerial photography (Fairchild C-15152, 1950), and inspected most of the fault features on the ground. All of the features shown on figure 2 were mapped by Clark (1978) except the north-south trending scarp in section 30 near the northwest corner of figure 26, which I mapped. That fault is shown shaded in blue, to distinguish it from Clark's mapping, which is shown as unshaded black lines. Also, my annotations are underlined in blue.

I judge only two of the fault features shown on figure 2 as probably having had Holocene offset: 1) the above mentioned north-south trending fault near the northwest corner of figure 2b and, 2) the north-south trending fault in the west-central part of figure 2a. These two faults both have a youthful geomorphic appearance, and both, in part, offset alluvial surfaces that are almost certainly of Holocene age. The scarps are 2 to 4 feet high along the youngest parts of both faults.

I judge part of the Laguna Salada fault as possibly having had Holocene offset: the segment extending southward from Highway 98 to Pinto Wash, in the southwestern corner of the Yuha Basin quadrangle (figure 2c). This segment of the fault is characterized by a west-facing scarp 10 to 20 feet high that is fairly well dissected. The scarp offsets an older alluvial wash surface of Pinto Wash. This surface is almost certainly older than Holocene; the present Pinto Wash surface lies about 50 feet below the faulted surface. Furthermore, to the north of Highway 98, where erosion has been more active during late Pleistocene and Holocene time, the fault trace becomes very difficult to follow, suggesting that there has not been significant Holocene offset.

All of the other faults shown in figure 2 have two characteristics:

1) they are well modified by erosion, and 2) they offset alluvial surfaces that appear to be older than Holocene.

## 8. Conclusions

I conclude, as stated above, that two of the faults have probably had significant Holocene offset, part of the Laguna Salada fault has possibly had significant Holocene offset, and all of the others have not had significant offset during Holocene time.

9. Recommendations

I recommend that the two faults that have probably had significant Holocene offset not be zoned. These fault segments are too short and local in nature, and do not appear to be part of any significant through-running fault. I make a weak recommendation for not zoning the segment of the Laguna Salada fault that I describe as "possibly" having had significant offset during Holocene Time; this segment is only about 1.5 miles long, and occurs out in the middle of nowhere. I recommend that none of the other faults be considered for zoning.

10. Investigating geologist's name and date

*Drew P. Smith*

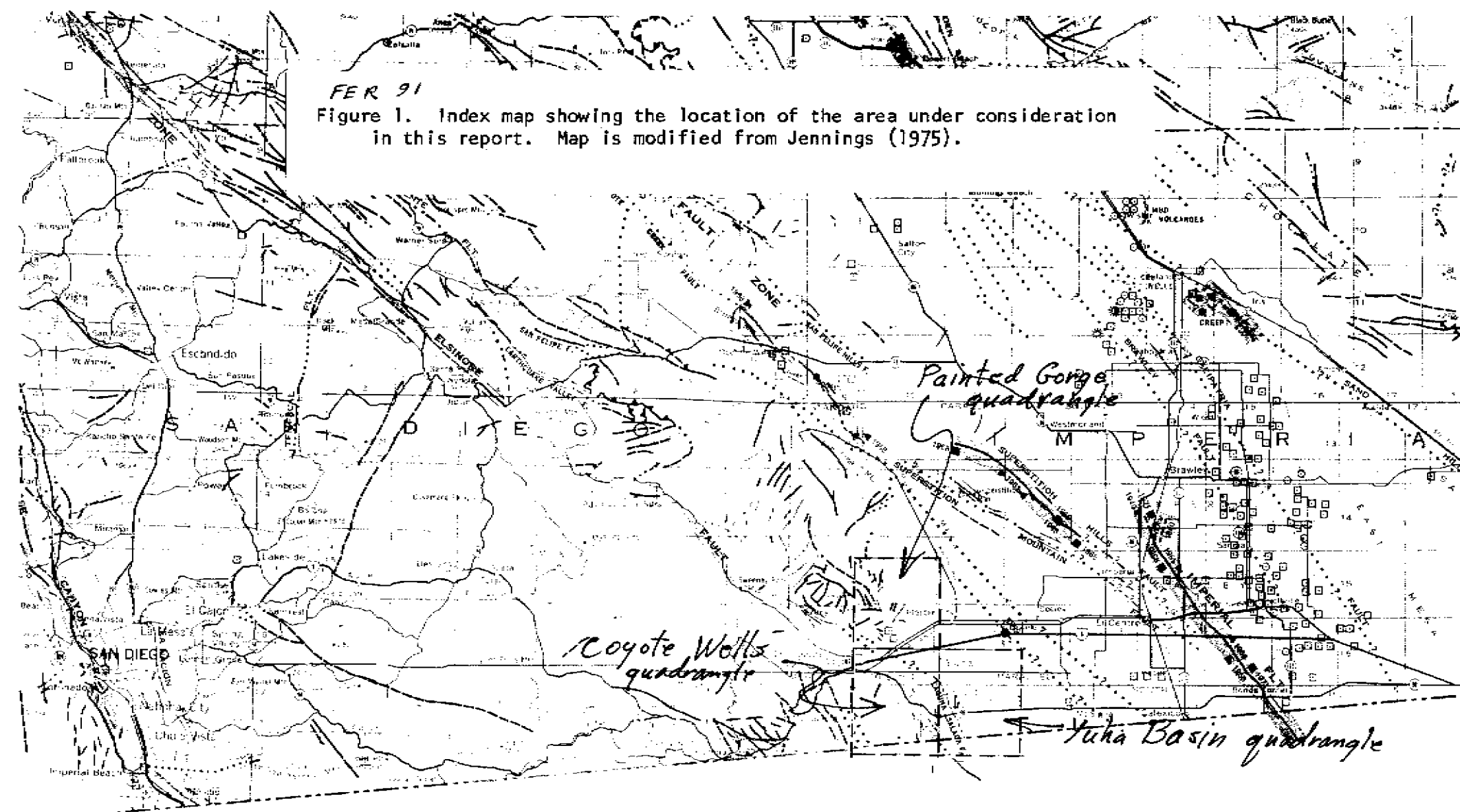
DREW P. SMITH  
May 18, 1979

*I concur with the  
recommendations. The faults  
of probable Holocene age are not  
significant enough to zone  
considering the remoteness of  
the area.*

*EMH  
5/21/79*

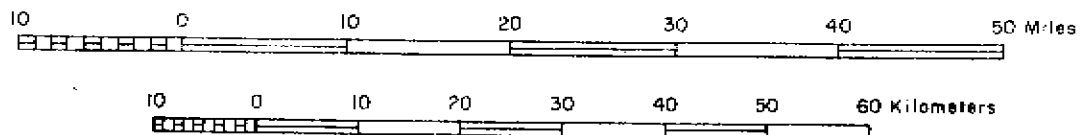
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Figure 1. Index map showing the location of the area under consideration in this report. Map is modified from Jennings (1975).



SCALE 1:750,000

(1 INCH EQUALS APPROXIMATELY 12 MILES)



The preparation of this map was financed in part through  
ment of Housing and Urban Development, under the prov  
amended.